Clinical Guidance

Management of Asthma in Pregnancy

Summary: This document is intended as a quick reference tool for the management of asthma in pregnancy for clinicians within the South West London & Surrey Heartlands Maternal Medicine Network.

Document Detail	
Document Type	PDF
Document name	Clinical Guideline: Management of Asthma in Pregnancy
Sites covered	St. George's Hospital, Croydon University Hospital, Epsom & St. Helier University Hospitals, Kingston Hospital, East Surrey Hospital, Royal Surrey Hospital, Ashford & St. Peter's Hospitals.
Document location	SWL & SH MMN Clinical Guidance Database
Version	1.0
Effective from	05.12.2024
Review date	05.12.2024
Owner	South West London & Surrey Heartlands Maternal Medicine Network
Author(s)	Dr. Siara Teelucksingh - Consultant Obstetric Physician
Approved by: Date:	SWL&SH Maternal Medicine Network, Clinical Reference Group 05.12.2024
Superseded documents	Nil
Related documents	St George's Hospital Guideline - Asthma - Dr Jane Evans & Dr Sachelle Ruickbie Kingston Hospital - Asthma Care Plan – Miss Amanda Ali, Dr John Chingewundoh
Keywords	Shortness of breath, Breathlessness, Wheeze, Asthma
Relevant external law, regulation, standards	

Change History		
Date	Change details, since approval	Approved by

Contents

Section Page number

1.0 Introduction

Asthma affects 4-8% of women of childbearing age and is the most common respiratory disorder in pregnancy.[1] This reference tool provides a summary of key points for managing asthma in pregnancy, highlighting the importance of optimal control, regular monitoring, and tailored treatment plans to ensure the best outcomes for both mother and infant.

2.0 Scope

This guide is intended to provide a concise overview for healthcare professionals managing asthma in pregnant patients in the South West London and Surrey Heartlands region. For specific case management, refer to the maternal medicine specialist multidisciplinary team.

3.0 Guidance

Definition & Diagnosis

- Asthma is a heterogeneous disease, usually characterised by chronic airway inflammation.
- Diagnosing asthma involves two primary components: identifying **a specific pattern of variable respiratory symptoms** (wheeze, shortness of breath, chest tightness and cough) that may vary over time and in intensity, together with variable **expiratory airflow limitation** with **excessive lung function variation**.
- ≥ 20% diurnal variation in PEFR (Peak expiratory flow rate) for 3 or more days per week during a 2 week period of monitoring is strongly suggestive of asthma.
- Diagnosis is confirmed by spirometry - Measurement of FEV1 (Forced expiratory volume in 1 second) and FVC (Forced vital capacity). Ideally this will be supplemented by evidence of reversibility (12% improvement to a bronchodilator or even an inhaled steroid or oral steroids). During pregnancy FEV1, FVC and PEFR are unchanged, but TLC (total lung capacity) and residual volume (RV) fall in the third trimester.
- Raised FeNO (fractional exhaled nitric oxide) may aid in the diagnosis and management as a marker of airway inflammation.
- In more complex cases, assessment by a specialist asthma team might be needed.

Pre-pregnancy Counselling and/or Booking Appointment

- Assess asthma severity and control

Asthma severity	**Intermittent**	**Mild persistent**	**Moderate persistent**	**Severe persistent**
Asthma control	**Well controlled**	**Not well controlled**	**Poorly controlled**	**Very poorly controlled**
Symptoms frequency and Short Acting Beta Agonist (SABA) use	<2 days/week	>2 days/week	Daily	Several times/day
Nighttime awakening	<2 times/month	>2 times/month	>1 time/week	>4 times/week
Interference with normal activity	None	Minor limitation	Some limitation	Extreme limitation

PEF or FEV1	>80% predicted or personal best	>80% predicted or personal best	60 - 80% predicted or personal best	<60% predicted or personal best

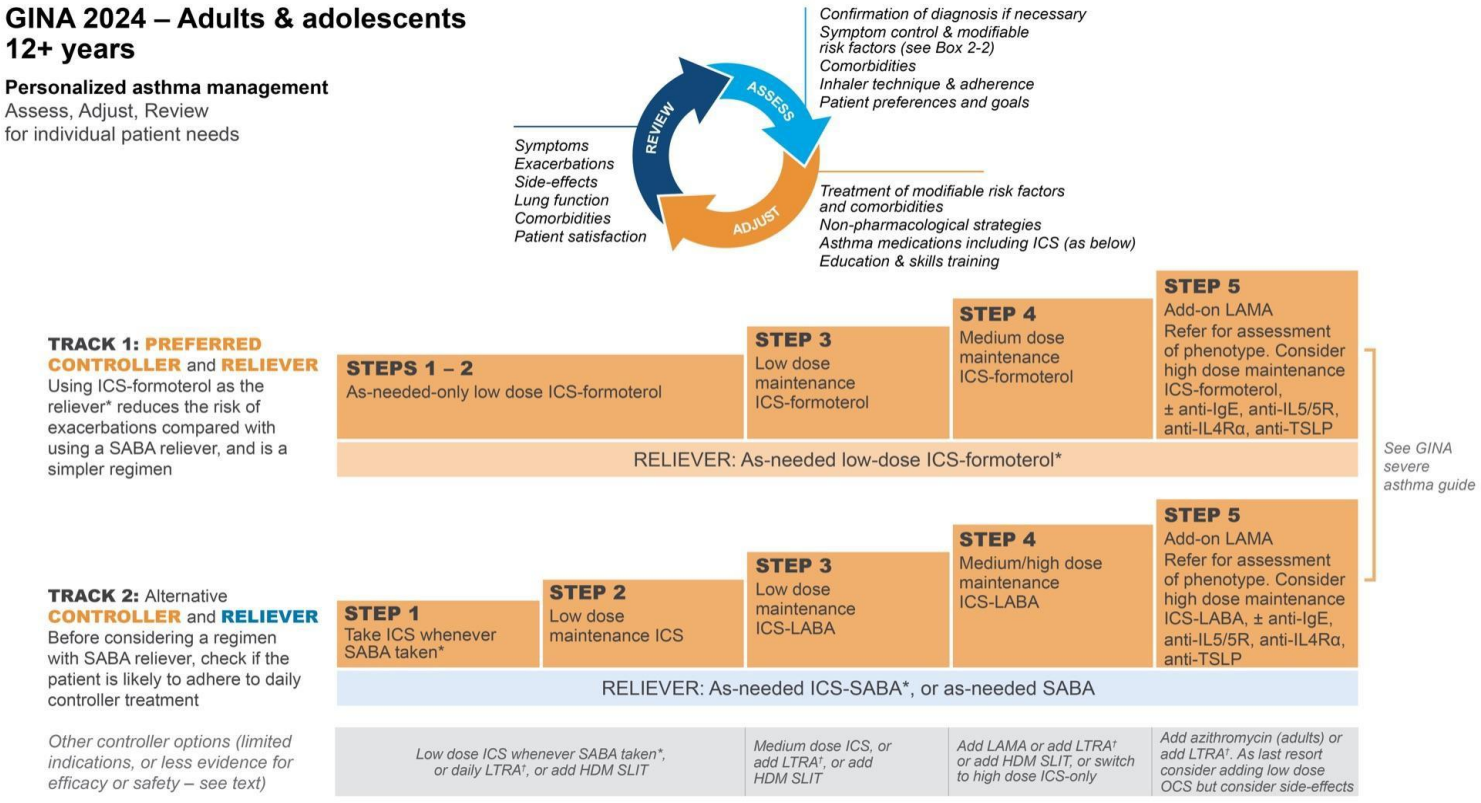
- Counselling
  - Control of asthma should ideally be optimised before conception.
  - Up to 20% of pregnant women with asthma may experience exacerbations, more frequently noted during the late second or early third trimester of pregnancy. As a general guide, 1/3 improve, 1/3 worsen and 1/3 stay the same.
  - Asthma treatment is safe in pregnancy and benefits of asthma medication outweigh any potential risks. **Asthma medication should NOT be stopped during pregnancy.**
  - Women with poorly controlled asthma and non-adherence to maintenance treatment are more likely to experience deterioration of asthma symptoms in pregnancy.
  - Discuss the effect of asthma on pregnancy and pregnancy on asthma:
    - Course is unpredictable but may follow previous pregnancies, in general 1/3 improve, 1/3 worsen, 1/3 unchanged.
    - Exacerbations more common 24-36 weeks, peak 32-34 weeks, less likely after 36 weeks.
    - There is some association between asthma and following conditions: pregnancy induced hypertension & pre-eclampsia, preterm labour and preterm birth, fetal growth restriction (FGR), neonatal morbidity (transient tachypnoea of newborn, admission to neonatal unit, neonatal seizures). Most of these are entirely caused by poor asthma control and not by its effective treatment.
  - Explain that any asthma exacerbations should be treated as prior to pregnancy.
  - Discuss the role of Influenza and COVID-19 vaccination in preventing viral exacerbations.
- Measure peak flow at booking, advise women to measure regularly and keep a record, particularly when there is an exacerbation.
- Assess for inhaler technique. Technique with metered dose inhalers is often less than ideal and a spacer is strongly recommended. Further information and video demonstration of the correct inhaler use can be found at https://www.asthmaandlung.org.uk/living-with/inhaler-videos

Mild, Intermittent or Well-controlled Asthma

- Routine antenatal appointments, blood tests and obstetric scans.
- Asthma should ideally be monitored every 6 weeks during pregnancy, even if asthma was previously well-controlled.
- Asthma control may be reviewed at routine obstetric and midwifery appointments in well-controlled women.
- A personalised written self-management Action Asthma Plan should be implemented.
- Review medication, adherence and inhaler technique:
  - Short Acting Beta Agonist (SABA), Inhaled Corticosteriods (ICS) , Long Acting Beta Agonist, systemic steroids – all safe in pregnancy.
  - GINA recommends that all patients with asthma should receive ICS-containing treatment, as this will substantially reduce their risk of exacerbations and adverse effects on the fetus compared with using a SABA alone.
  - LTRA (Leukotriene Receptor Antagonists) are less preferred as they are associated with an increase in psychiatric morbidity.
  - Omalizumab (Xolair) should be continued if established on use prior to pregnancy.
- Asthma control should be assessed regularly using peak flow monitoring and the Asthma Control Test (ACT).

Moderate, severe or poorly controlled Asthma

- Refer to the Maternal Medicine Team.
- Asthma treatment is escalated according to the GINA guideline and Respiratory input is sought.



- Referral to High Risk Obstetric Anaesthesia is recommended in moderate-severe asthma.
- Spirometry, peak flow diaries and the use of Fractional exhaled Nitric Oxide (FeNO) may help distinguish between pregnancy-related breathlessness and asthma exacerbations.

Systemic corticosteroids

- Effective treatment warranted for asthma exacerbations - usually prescribed as a course of Prednisolone 40-50mg for 5 days, occasionally weaning regimes are recommended.
- Gastroprotection with PPI should be offered.
- Regular monitoring includes blood pressure checks and screening for gestational diabetes.
- Home blood glucose monitoring is recommended for women on oral corticosteroid therapy beyond 28 weeks.

Biologics

- Omalizumab (Xolair) should be continued if established on use prior to pregnancy.
- **In cases where other biologics are considered, we advise engaging in individual case discussions within a multidisciplinary team.** Women should receive counselling emphasising the need to weigh the potential risks of biologic exposure during pregnancy (unknown except for omalizumab) against the well-documented risks posed to both themselves and their children by unmanaged asthma.

Indications for referral to a Multidisciplinary Obstetric Medicine clinic within the Maternal Medicine Centre

These patients will need to be seen locally by a respiratory team in the first instance and then a referral can be considered to the MMC for further support

- Persistent, severe or uncontrolled asthma.
- Asthma exacerbations requiring frequent oral corticosteroids or hospital admission.
- Discussion for stepping up asthma treatment beyond ICS; consideration of biologic therapy.
- Other clinician concerns.

Maternal Surveillance & Managing Comorbidities

- Address comorbidities including allergic rhinitis, GORD, anxiety and depression.
- Treat chest infections promptly with antibiotics if indicated.
- Refer to smoking cessation services for consideration of nicotine replacement therapy (NRT).
- Regular monitoring includes blood pressure checks and screening for gestational diabetes for patients on systemic corticosteroids.
- Labetalol should be avoided in severe or brittle asthma – can induce or worsen bronchospasm.
- Vaccination – strongly advise vaccination for flu, RSV and covid

Fetal Surveillance

- Routine antenatal care should include blood tests, dating scans and anomaly scans.
- Surveillance for FGR is recommended in women with moderate to severe asthma from 28 weeks onward.
- Daily fetal heart auscultation or CTG for patients admitted with acute asthma exacerbations.

Labour and Birth

- Asthma exacerbations are rare during labour due to the endogenous production of steroids.
- Women should continue their inhalers during labour as there is no evidence to suggest that beta 2 agonist inhalers will impair uterine contractions.
- There is minimal systemic absorption of inhaled salbutamol to warrant routine monitoring blood glucose levels in the baby after birth. Neonatal blood glucose checks may be considered if women use frequent or high doses of SABA.
- Vaginal delivery is generally preferred unless obstetric indications warrant Caesarean birth.
- There is no contraindication to water birth or delivery in low risk units for women with well controlled asthma.
- Parenteral hydrocortisone 50-100 mg 8 hourly is typically given to cover the stress of labour or Caesarean delivery for women on a dose of systemic corticosteroids ≥ prednisolone 5mg once daily for ≥ 3 weeks duration.
- Regional rather than general anaesthesia is preferred due to decreased risk of chest infection and post-operative atelectasis.
- Women with severe or uncontrolled asthma should have continuous electronic fetal monitoring (CEFM).
- Prostaglandin E2 (prostin) can be used.
- In the event of PPH, oxytocin, TXA and misoprostol are the first line agents.
- Use of Ergometrine and Prostaglandin F2α (carboprost) to treat life threatening postpartum haemorrhage may be unavoidable; should be used with caution as both can cause bronchospasm.

Postnatal Care

- Breastfeeding is encouraged and may reduce the risk of asthma in the infant - the risk of atopic disease developing in the child of a woman with asthma is about 1 in 10, or 1 in 3 if both parents are atopic.
- Asthma symptoms often revert to pre-pregnancy levels postpartum.
- There is an increased risk of psychiatric conditions including postpartum depression, necessitating comprehensive mental health support.
- NSAIDs – only about 10% of asthmatics are sensitive to NSAIDs, ask about previous use before withholding medication especially after Caesarean birth.
- Ensure the patient has a follow up appointment with the asthma team postnatally.

Management of Asthma Exacerbation in Pregnancy or Postpartum

Patients presenting with any of the following features should be considered unstable and may warrant treatment of an exacerbation or hospital admission:

- nocturnal symptoms interrupting sleep (usually cough and dyspnoea)
- worsening cough
- increased use of $ß_2$-agonists (less effective and relief shorter lasting)
- decreased efficacy of rescue medication (such as reliever inhalers or corticosteroids)

Remember that a previous admission to hospital, particularly if it required treatment in ICU, should be taken to indicate that the patient is prone to life-threatening episodes.

The features of severe asthma include:

- peak flow < 50% predicted or best achievable by patient
- tachypnoea (> 25 breaths/min)
- tachycardia (> 110 beats/min)
- unable to complete full sentences

The features of potentially fatal asthma include:

- peak flow < 33% predicted or best achieved by patient
- cyanosis/hypoxia
- silent chest on auscultation
- bradycardia/hypotension

Pharmacologic Therapy

Oxygen

Patients with acute severe asthma are hypoxaemic and this should be corrected urgently with controlled supplementary oxygen adjusted to keep SpO_2 94-98%.

Bronchodilators

A bronchodilator, such as Salbutamol (2.5-5 mg) should be started as soon as possible via an oxygen-driven nebuliser (drive at a flow rate of at least 6 L/min). This dose can be repeated at 15-30 min intervals if no improvement is seen. Nebulised Ipratropium bromide (500 micrograms) helps in about 30% of patients with acute asthma and may be given every 6 hours. Parenteral/IV beta-2 agonists may have a role in ventilated patients or those in extremis but there is limited evidence to support this.

Corticosteroids

Patients should be given Prednisolone 40-50 mg od by mouth or Hydrocortisone 100 mg IV 6-hourly as soon as the initial assessment is made. No material benefit can be expected for several hours but it is essential not to delay administration. Whichever steroid is given initially, corticosteroids

should be continued for a minimum of 5 days or until recovery. The Prednisolone dose does not need to be tapered off, unless the patient is on a maintenance dose or steroids are required for more than 3 weeks. Inhaled corticosteroids should be started as soon as possible.

Hydration
Some patients require intravenous hydration. Monitor electrolytes, particularly potassium, as hypokalaemia may develop.

Magnesium
In patients with severe asthma who respond poorly to initial treatment, or with life-threatening asthma, after discussion with senior medical staff, consider giving a single dose of intravenous Magnesium at a dose of 2 g (8 mmol) in 250 mL of NaCl 0.9% over 20 minutes.

Aminophylline
Intravenous Aminophylline should only rarely be given in acute asthma because it is difficult to use and has limited efficacy. Its administration should be limited to patients in whom all other treatments have failed, the patient continues to deteriorate, and intubation is imminent. Cardiac monitoring is essential during administration and levels should be monitored.

VTE Prophylaxis
VTE prophylaxis should be prescribed for all patients admitted with asthma exacerbations.

Monitoring and Escalation

Monitoring
Maternity Early Warning Score (MEWS) should be used.
Measure arterial blood gases on admission and repeat as necessary to assess progress. When interpreting arterial blood gases in pregnancy, it should be remembered that the progesterone-driven increase in minute ventilation may lead to relative hypocapnia and a respiratory alkalosis, and higher PaO2, but oxygen saturations are unaltered. A PCO_2 greater than 6kPa suggests the patient is at imminent risk of respiratory failure and so in need of mechanical ventilation. Use pulse oximetry to monitor the patient's oxygen saturation and assist in assessing response to treatment if the patient has either deteriorated rapidly over a few hours or has previously been in ICU with an attack of asthma. Record peak flow on initial assessment, before and after bronchodilator treatment, and again after at least one to two hours.

Where to Admit
Pregnant patients admitted with an exacerbation of asthma should be managed in a unit equipped with access to regular nebulisers, close monitoring and the ability to escalate ventilatory support. Appropriate clinical areas include A&E, medical wards include a level 1-1.5 acute medical or respiratory ward, level 2 (HDU) or Level 3 (ICU).

Inpatient Management
A progressive improvement in morning peak flow should be seen before discharge. Patients should normally be transferred from nebulised to inhaler therapy when peak flow approaches normal limits. Prior to discharge, it is essential to check that the patient has a good inhaler technique, that if the technique is poor the patient is re-taught, and that the correct device is prescribed for their needs.

Discharge
Patients should be discharged on inhaled and/or oral steroids (as appropriate to their previous history and current severity) and an asthma action plan. They should be reviewed by their GP in 2 days and by an asthma specialist within 4 weeks. Peak flow monitoring should be undertaken by patients who have difficulty telling if their asthma is deteriorating.

4.0 Contact Details

Within the hospital – each hospital will have individual arrangements
Maternal medicine consultant & midwives Consultant Respiratory Physician: preferably the woman's named consultant if possible **Acute exacerbation management:** Medical team team via A&E Maternal medicine team must be informed of admission and review the woman as an inpatient
Within network for specialist or multidisciplinary input
Maternal medicine clinician to refer patient using Refer-a-Patient platform

5.0 References and Abbreviations

References

1. Shebl E, Chakraborty RK. Asthma in Pregnancy. [Updated 2023 Jun 26]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK532283/
2. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention. 2024. Updated 2024. Available from: www.ginasthma.org

Abbreviations

A&E	Accident & Emergency
ABG	Arterial Blood Gas
ACT	Asthma Control Test
CEFM	Continuous Electronic Fetal Monitoring
CMW	Community Midwife
COVID-19	Coronavirus Disease 2019
CTG	Cardiotocography
FeNO	Fractional Exhaled Nitric Oxide
FEV1	Forced Expiratory Volume in one second
FGR	Fetal Growth Restriction
FVC	Forced Vital Capacity
GINA	Global Initiative for Asthma
GORD	Gastro-Oesophageal Reflux Disease
HDP	Hypertensive Disorders of Pregnancy
HDU	High Dependency Unit
ICS	Inhaled Corticosteroids

ICU	Intensive Care Unit
LABA	Long-Acting Beta Agonist
LAMA	Long-Acting Muscarinic Antagonist
LTRA	Leukotriene Receptor Antagonist
MEWS	Maternity Early Warning Score
NRT	Nicotine Replacement Therapy
NSAIDs	Non-Steroidal Anti-Inflammatory drugs
OCS	Oral Corticosteroids
PEFR	Peak Expiratory Flow Rate
pCO2	Partial pressure of Carbon dioxide
pO2	Partial pressure of Oxygen
PPH	Postpartum Haemorrhage
PPI	Proton Pump Inhibitor
RV	Residual Volume
SABA	Short-Acting Beta Agonist
SAMA	Short-Acting Muscarinic Antagonist
SpO2	Saturation of Peripheral Oxygen
TLC	Total Lung Capacity
TXA	Tranexamic Acid
VTE	Venous Thromboembolism